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ABSTRACT

Presented in this paper are a selective review and summary of recent research findings concerning the adult's role in infant development. After an introduction setting forth assumptions guiding the selection of issues and findings, the first section discusses research on parent/infant interaction. Some of the classic concepts of infant development, such as bonding and fear of strangers, are critically examined. Also discussed in the first section are the early relationship between parents and their infant, early forms of self-regulation, interaction at a distance, the beginnings of infant initiative, coping with an expanding awareness and new emotions, and the beginnings of self-assertion. The second section examines the role of nonfamilial caregivers, specifically in relation to group care contexts and their impact on the infant and on the parent-infant relationship. Specific attention is given to the effects of day care on cognitive development and the role of other children in group care settings. The third section considers issues related to lasting effects of the infant's early experience with adults. Discussion focuses on infants at risk, effects of the physical environment, and the need for improved research. Finally, several conclusions based on the reviewed findings are offered. (RH)

THE ROLE OF ADULTS IN INFANT DEVELOPMENT: IMPLICATIONS FOR EARLY CHILDHOOD EDUCATORS

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INTRODUCTION

Parenting, and its effect, has been the major subject of research related to the adult's role in early human development. As society's need for child care shifts to accommodate the needs of infants and toddlers, perspectives of the early childhood educator have been similarly broadened. The result is the expansion of the field of early childhood education to include children under the age of 3. Although some might label infant and toddler programs, day care, and mother-infant programs as "caregiving," rather than "educational," the traditional concerns of the professional early education specialist do not vanish by this semantic magic.

Infants are more closely allied with, and protected by, the home environment than are their elementary-school-age counterparts. Infants have a greater need for externally imposed controls and guidance when outside the home than do older children. This paper presents a brief review and summary of recent research findings related to the adult's role in infant development. The selection of issues and findings presented here has been based on the following assumptions about infant development:

1. Adults are critical factors in the development and maintenance of cognitive, social, and emotional growth in infants and young children.
2. Parents and caregivers/educators can share in the infant's developmental progress. After the first year of life, infants can maintain qualitatively different relationships with each of the adults with whom they have regular contact.

3. During the first 3 years of life, more so than at any other age, educators must be aware of the specific nature of their own contributions and must comprehend how these contributions relate to those of other significant adults in the infant's life.
4. During the child's infancy, early childhood educators can serve an important role as educators of both parents and their infants. Therefore, knowledge of developmental processes in normal infants, particularly in the realm of social and emotional development, is essential.

In the first section of this paper, research on the parent-infant relationship will be discussed. Some of the classic concepts of infant development, such as bonding and fear of strangers, will be examined critically. The next section of the paper examines the role of nonfamilial caregivers, specifically in relation to group-care contexts and their impact on the infant and on the parent-infant relationship. Finally, issues related to the lasting effects of the infant's early experience with adults will be considered.

THE PARENT-INFANT INTERACTION

Recent research on the importance of parents in infants' lives has addressed several questions: At what age do infants recognize their parents? How important is early contact? and, How does the parent-infant relationship change with age?

One of the most important aspects of the parent-infant relationship is the infant's attachment to the parent, and vice-versa. When does this attachment begin? Some have thought that the infant becomes attuned to the sound of the mother's heartbeat during prenatal development, although

there is little concrete evidence for such a position (Detterman, 1978; Salk, 1978). More research has focused on the moments immediately following birth, hypothesizing that the amount of physical contact between parent and infant during that period will determine the course of their later relationship. The quality of the parent-infant relationship has been termed "bonding."

Bonding and Early Contact

Bonding has a number of definitions. Some use the word to signify the relationship of attachment between infant and parent. In this regard, one might hear someone speak of a relationship as being "bonded" or "not bonded." Bonding also has been used to refer to the events that take place during the first few hours after the birth of an infant, when parent and infant are placed alone together and in skin-to-skin contact, although this is more properly called "early contact." Finally, some people refer to bonding as the process that translates the latter experience into the former. These individuals hypothesize that skin-to-skin contact in the first hours after birth will predispose the parent-infant pair to a closer, more affectionate, and warmer relationship later on. In the research literature, however, bonding refers only to the parent's attachment to the child.

The current concerns about early contact and bonding grew out of the pioneering work of Marshall Klaus and John Kennel of Case Western Reserve University. Their first reports detailed an apparently universal pattern of behavior seen in mothers presented with their naked newborn immediately after birth. The mothers in their study first touched the neonate's fingers and toes for 4 to 8 minutes, then touched the infant's limbs, ending with an encompassing palm contact to the infant's abdomen accompanied by massaging movements (Klaus, Kennell, Plumb, & Zuehlke,

1970). In the same study, it was found that right after birth mothers of premature infants progressed through the same phases, but they took a longer time exploring the baby's body than did the mothers of full-term infants.

Since then, studies reflecting this pattern of adult behavior at first contact have been replicated on many occasions and in a wide variety of settings. It also has been shown that fathers, when given the same opportunity to lie next to their newborn infants, progress through the same sequence of activity (McDonald, 1978; Rodholm & Larsson, 1979).

Though no one doubts the validity of the first-contact behavior pattern, a controversy has arisen over the relative importance of this behavior, or the lack of it, for the infant's development. Not long after these initial findings had been published, Klaus and colleagues conducted a study showing that mothers who had early contact with their infants in the newborn period were likely to spend more time holding their 1-month-old infants in an en-face position, in which the adult holds the infant so that each has a full view of the other's face (Klaus, Jerauld, Kreger, McAlpine, Steffa, & Kennell, 1972). In this study, the subjects were 28 low-income primiparous (first-time) mothers who did not plan to breast-feed. Compared with a control group of mothers who received routine hospital care, the experimental group had 1 hour of extra contact with their naked infants at birth and another 5 hours of extra contact each afternoon while in the hospital. The subjects were randomly assigned to experimental versus control groups, and the observers at one month were not aware of the group identity of the mothers.

Another study employed a sample of middle-class Caucasian infants from Canada who had normal deliveries (Kontos, 1978). The experimental

group had 1 hour of extra contact beginning 45 minutes after birth. In follow-up observations at 1 and 3 months, the extra-contact group mothers did more smiling, singing, held their babies more in the en face position, and played more without the use of a toy than did the control group. This study used procedures of random assignment to experimental versus control groups similar to those of Klaus et al. (1972). The study was somewhat flawed, however, since only one of the two observers at the 1- and 3-month sessions was blind to the mother's group identity. We thus have no way of knowing in what way the informed observer might have influenced the naive observer.

In a well-controlled study done in Sweden, Schaller, Carlsson, & Larsson (1979) found evidence of higher levels of proximal contact (rubs, pats, kisses, and touches) in extended-contact mothers at 2 and 4 days, but no differences at 42 days. As in other studies, Schaller et al. compared a limited-contact group, who were allowed to hold their babies for only 5 minutes immediately following birth, with an extended-contact group, who held their naked infant for 1 hour after birth. A replication study by the same group of investigators (Carlsson et al., 1979) yielded similar findings: differences in the first few days, but no differences 1 month later.

Another Swedish study gave extra-contact mothers skin-to-skin contact with their babies for the 15 minutes following birth that control-group babies were being weighed, washed, and dressed (DeChateau, 1980). This investigator reported some differences between extended-contact and control groups at 36 hours, but only in the position in which the mothers sat to hold their infants while feeding. In a 3-year follow-up, no differences were reported.

Finally, Sveda, Campos, and Emde (1981) had a similar experimental design, but took further precautions with their American middle-income sample. They made sure that each of the study mother's roommates received the same procedure and that there was only one study mother on the maternity ward at any time. By thus eliminating comparisons with other mothers, this prevented the mothers in the study from feeling special or different from other mothers in the hospital. Sveda et al. found no differences between experimental and control groups in mother-infant interaction at 36 hours after birth.

Although it is impossible to prove that early contact has no long-term effects, these studies, done in different countries and under many different conditions, seem to suggest that any differences due to extended or early contact are at best transitory, lasting no more than a few days or months. All of these studies have focused on maternal attachment or changes in maternal behavior following the experience of early contact. There is currently no evidence indicating that any of these manipulations has any effect on the baby's future attachment to the mother or on future cogritive and linguistic proficiency, in spite of news media claims to the contrary.

There is some evidence that early contact has effects on mothers from low-income groups, or on mothers who are at risk for attachment problems (Klaus et al., 1972). In these cases, the additional contact seems to act as an important boost to get the parent-infant system started. In ordinary cases, however, the parent-infant relationship has enough alternative resources to maintain its course without the benefit of additional early contact.

In general, the implication of this research is that parents who do not have the opportunity for extra early contact need not worry about the well-being of their infants. Indeed, there are many situations in which extra contact is impossible, as is the case for some premature infants, sick infants, sick mothers, or infants put up for adoption. In these cases, it is especially important for the family not to be beset by worries about what may have been lost, but rather to devote their energies to developing their relationships with the infant and to developing the family strengths necessary to cope with a high-risk infant.

None of this discussion is meant to deny the fact that it may be more satisfying for both parents to have the opportunity for early contact with their baby than to be isolated artificially by hospital rules and regulations. It therefore may be more convincing to argue for early and extended contact on the grounds of ensuring that each family gets the fullest possible enjoyment out of the childbirth experience, rather than on the grounds of preventing any lasting detrimental impact arising from the lack of that early contact.

The Early Relationship between Parent and Infant

Even though there is little evidence for the long-term impact of early extended contact, infants do learn to recognize their caregivers at an early age. In fact, studies have shown that the infant prefers his or her mother's voice to the voice of an unfamiliar female in the first few days of life (DeCasper & Fifer, 1980), and that, by the age of 3 months, most infants prefer to look at their mothers than at unfamiliar women (Barrera & Maurer, 1981; Hayes & Watson, 1981).

However remarkable these findings may seem, they do not prove that lack of visual or auditory exposure to the parent is necessarily detri-

mental. Blind infants do quite well without this kind of stimulation; they learn to recognize their caregivers by sound and touch (Fraiberg, 1974). These results, taken together, suggest that parents and infants are beginning to adapt to each other from the beginning of life. However, there is considerable flexibility in the way this process occurs, leaving open a wide range of developmental variations that can be considered "normal."

Sander (1964) has suggested that the first phase of the parent-infant relationship, lasting from birth until about 2 months of age, is concerned primarily with the establishment of regular patterns of sleeping, feeding, arousal and quieting. In this phase, the parent's job is to get to know the baby's rhythms and to help the baby adjust those rhythms to fit into the routine of the family.

Parents in this period create frames in which the infant can function. Frames are structures that initiate, maintain, and support adaptive functioning in the infant (Kaye, 1982). In the feeding frame, for example, the parent provides not only the food, but also a setting in which the infant can take full advantage of the warmth and tactile and vestibular stimulation that is provided. Other frames mentioned by Kaye are the discourse frame, the feedback frame, the memory frame, the modeling frame, the nurturant frame, and the protective frame. The discourse frame, for example, is one in which the parent creates the conditions under which a meaningful dialogue may take place. A situation within the discourse frame might be a "give-and-take" game in which the adult offers toys and then takes them from the infant, punctuating the actions with vocalizations. At the outset, this dialogue is likely to be one-sided, with the baby merely receiving the toy from the adult. Gradually, however, the baby learns the game by adopting bits and pieces of the routine, perhaps making a tentative offer or tugging at the adult's hand.

This example also embodies some of the other frames described by Kaye. Specifically, in the process of creating the frame for the discourse, the adult serves as the infant's external memory by picking up the game the next time where it was left off, even if the baby does not remember this. In addition, the adult serves as a model of appropriate action routines and as a source of feedback by helping the infant execute action that is consonant with the rules of the game.

Early Forms of Self-regulation

Very young infants, even newborns, have a remarkable array of sensory and motor abilities. They can attend visually to the environment, and they can hear, smell, feel, and taste (Fogel, in press). Although to remain alive and to acquire nourishment and stimulation the infant is dependent upon the adult, babies are born with rudimentary self-protective and self-calming abilities. One such ability, habituation, is the ability to "tune out" stimulation that is too noisy or too bright. If a stimulus is too intense, the infant will gradually look or listen less. Babies are also born with a set of reflexes that serve self-protective functions, such as turning the head away from nasal occlusion.

Another form of self-regulation, sucking on a pacifier, or non-nutritive sucking, occurs in many forms throughout infancy. If we count any incidence of non-nutritive sucking--on pacifiers; toys, fingers and thumbs, an adult's fingers--about 60 to 90% of all infants engage in this practice. Non-nutritive sucking usually stops at the end of the first year of life. It may, however, continue to occur until 4 to 7 years of age if the child is hungry, tired, or unhappy. A small proportion of children suck their thumbs until adolescence. In infants, thumb sucking appears primarily during sleep after the age of 4 months (Kessen, Haith, & Salapatek, 1970).

Pacification is one reason infants may suck. Whether associated with nutritive intake or not, sucking is an activity that immediately induces a state of calm in the infant. Another reason for non-nutritive sucking may be that it feels good. Sucking may be related neurologically with pleasure, or the infant may learn the association between the sucking response and the pleasurable intake of nutrient. Regardless of the particular reason, non-nutritive sucking appears to be a spontaneous behavior that has some important benefits to the newborn and older infant.

An infant's sucking on a pacifier is perceived as negative by a number of individuals. One of the reasons for such a perception is that the practice is primarily self-stimulation, suggesting to some observers that the infant somehow is not dealing effectively with the environment. The argument presented here, contrary to this view, is that non-nutritive sucking, like habituation, allows infants an opportunity to use their own resources for self-regulation. Even though the infant acts unselfconsciously, these behaviors are important steps on the path toward individual autonomy.

Interaction at a Distance

As infants begin to refine their visual-perceptual abilities and to recognize familiar people in their environment, they learn to appreciate noncontact interactions such as face-to-face play, in which parents and infants exchange smiles, gazes, and coos. According to Sander (1964), the period from 4 to 6 months is one in which the parent and infant, based on their prior familiarity, learn better to coordinate their feeding, playing, and other mutual activities.

Since all of the young infant's behavior is nonverbal, how does the parent or caregiver know what the infant needs or wants? In general, the

process of "reading" a baby's signals is one involving some trial and error. The caregiver must experiment with different techniques in order to find the responses that best suit the needs of the infant. It is not unusual for parents initially to misunderstand the infant's needs.

Some of the baby's signals are obvious: crying and smiling, for example. But there are many things that infants do during face-to-face interaction that may not have a clear meaning to adults. The baby's turning away from the interaction is one example of this ambiguity. Such gaze aversion has been interpreted to mean that the infant needs a "time out" from the interaction (Brazelton, Koslowski, & Main, 1974; Stern, 1974). Field (1982) studied gaze aversion in relation to changes in the infant's heart rate and the mother's behavior, finding that both gaze aversion and the infant's average heart rate were higher when the mother was trying to get the infant's attention. But she also found that heart rate and gaze aversion were equally high when the mother was asked to assume a "still-faced" expression--sitting quietly and looking at the infant. Gaze aversion may be a rudimentary coping skill whereby the infant can regulate the amount of visual stimulation according to his or her own abilities to process it (Fogel, 1982; Stern, 1974).

Field's (1982) study suggests that infants will avert their gaze if the caregiver does too little or if he or she overstimulates the baby. Kaye and Fogel (1980) found that in order to get their infant's attention, mothers increased the amount of touching and bouncing when the infant was looking away. After the infant looked at them, they began to increase the amount of facial expressiveness they displayed to the baby. It was found that facial expressiveness was more likely to maintain the infant's attention, while vestibular-tactual stimulation was used to attract the infant's attention when the baby was looking away.

Adults can read the infant's readiness to interact from the brightness versus dullness of the infant's eyes, raised versus furrowed brows, or smiling versus frowning. The infant's body position is also meaningful: slumping over, actively turning away, back arching, and squirming usually mean the baby wants a change of activity.

But can an infant "read" the signals of the adult during interaction? There is very little evidence that infants under 4 months of age can do so. In general, the infant's behavior is rigid and repetitive. Although it seems as though the mother and infant are "with" each other as infant arousal builds to a peak and tapers off, the research suggests that infants have little control over the pattern and timing of their own behavior (Kaye, 1982). For example, during face-to-face play at this age, infants may emit a series of cooing vocalizations and their caregivers may respond to each with another vocalization. The result looks like a mutual exchange of vocal "turns." Microanalyses of the behavior sequences during this sort of interaction, however, have revealed that the parent is responsible almost entirely for this effect, which is accomplished by skillfully inserting an imitative coo in between each of the baby's sounds (Fogel, 1977; Kaye & Fogel, 1980).

The adult becomes adept at fitting his or her behavior into the infant's cycles of activity and nonactivity. This pattern has prompted one investigator to label the early parent-infant interaction a pseudo-dialogue (Newson, 1977). This label suggests that the parent acts as if the baby had all the social skills of an older child, treating the baby's automatic actions as though they had some meaning and as if they were part of a true social act directed toward the parent. Infants of this age can and do feel pleasure, distress, disappointment, and wariness (Sroufe, 1979); nevertheless, their ability to take social initiatives is rather limited.

The Beginnings of Infant Initiative

Starting at about 5 months of age, infants begin to take an increasingly active role in their social relationships (Kaye, 1982; Kaye & Fogel, 1980; Sander, 1964). They can now initiate social exchanges, anticipate, and play their first genuinely participatory games. At this age we also see an end to the period in which the caregiver does most of the "mutual adjustment" work. Kaye (1982) has suggested that at this age infants can be thought of as apprentices. They can take some initiatives on their own, but they still need the guidance of the "master," who sets up more advanced kinds of frames for them. Thus, a baby can learn to hide his or her own face, or that of the mother, but only in the context of a peek-a-boo routine that the parent has modeled and created for the baby.

By the end of the first year, the infant's initiatives have become more akin to demands, and the baby enters the period of expressing a desire to be near the caregiver, a wariness of strange situations, and a more realistic awareness of other people in the environment. Since this is the age at which the infant becomes attuned to the presence of other people and begins to understand them to be physically and emotionally different from the mother and father, and the age at which the infant begins clearly to express different emotional reactions to different people, it is a period that early childhood educators must understand more fully. Recent research has shed considerable light on the nature of the 12-month-old's fears and on how the baby can best cope with them.

Coping with an Expanding Awareness and New Emotions

In the realm of sensorimotor development, the infant at 12 months of age is trying out new means to reach goals (Piaget, 1952). The psychological experience associated with this motor behavior is a mental compari-

son of alternatives. This sort of appraisal means that the infant does not react immediately, in knee-jerk fashion, to a particular event but tries to evaluate the event's effect with respect to possible alternative responses. Because infants have only rudimentary intrinsic appraisal skills at this age, they sometimes cope with their feelings of uncertainty by turning to the people around them for help. They will look to see how those people react to events and then adjust their own feelings accordingly.

The social referencing implicit in such behavior has been investigated in situations provoking uncertainty and fear. In one study, a noisy, flashing robot approached a 1-year-old child who was sitting nearby. The child's mother was asked to make either a fearful face, a smiling face, or a neutral face. Infants were less likely to be upset by the toy when their mothers posed either the smile or the neutral face (Klinnert, 1981). Similar results were found even if the adult was a stranger to the infant.

Feelings of uncertainty become more common as the infant develops cognitively. Related emotions, surprise and fear, also do not appear before the eighth or ninth month of life (Piaget's Stage IV). Because infants now have the ability to plan and to anticipate, they can be surprised by unexpected turns of events (Charlesworth, 1969). If the event is unexpected and seems threatening, then the infant feels fear. By the end of the first year of life, infants experience the emotion of fear in a wide variety of situations.

Infants may become fearful of an otherwise benign situation because it reminds them of something they found stressful, frightening, or painful in the past. Such acquired fears can be said to arise from a conditioned association and are different from fear of heights or of looming objects, which may be universal. Acquired fears are learned; examples include

fear of particular people, of doctor's offices, or of certain kinds of sounds, such as a dog's barking (Bronson, 1972).

Infants also may be afraid of unfamiliar settings or unfamiliar people. Although infants' reactions to strangers are usually different from their responses to their parents, infants are not always fearful of strangers. Babies show more positive reactions if the stranger approaches them slowly (Kaltenbach, Weinraub, & Fullard, 1980; Trause, 1977), if their mother is present when the stranger approaches (Eckerman & Whatley, 1975; Ricciuti, 1974; Trause, 1977), if they are with a familiar caregiver such as a babysitter or child-care provider (Fox, 1977; Ricciuti, 1974), if the stranger is a child as opposed to a normal adult or a midget (Brooks & Lewis, 1976), if the stranger does not tower over the infant (Weinraub & Putney, 1978), and if the infant is in an unfamiliar setting such as a laboratory as opposed to the home (Brookhart & Hock, 1976; Sharln, 1977).

A number of studies have shown that babies can engage in positive and rewarding social interaction soon after meeting a new person. If the stranger proves acceptable to the baby, the baby will often spend more time playing with this interesting visitor than with the mother (Klein & Durfee, 1976; Ross & Goldman, 1977).

On the other hand, if the stranger approaches too quickly, looms, towers, or otherwise violates the infant's personal space, fearful reactions can easily be evoked. But would an adult react any differently? In one study (Kaltenbach, Weinraub, & Fullard, 1980), mothers and their 8-month-old infants sat side-by-side as unfamiliar female adults approached them quickly. The mothers showed more quizzical looks, frowns, and gaze aversions as the stranger got closer than did their infants! This finding

suggests that "stranger fear" is not simply a stage of development that babies go through. Rather, it may represent a growing awareness of situations that all humans fear, a step toward becoming more adult. Hesitancy toward strangers, especially intrusive ones, is something that stays with us throughout our lives.

Also commonly expressed at this point in the infant's development are fears of separation. Being left alone is a terrible experience for most babies 12 months of age. Developmentalists once thought that separation distress or fear came from the baby's sense of loss due to separation from the parent. Research has shown, however, that if parents leave their babies in the company of familiar caregivers there is little or no separation distress (Ricciuti, 1974; Stayton, Ainsworth, & Main, 1973; Suwalsky & Klein, 1980). In one study of children admitted to residential care, it was found that infants admitted with a sibling showed less separation distress than if admitted by themselves, even if the sibling was not old enough to take care of the infant (Heinicke & Westheimer, 1966). Another study found that infants left with a total stranger coped significantly better with separation than infants left completely alone (Ricciuti, 1974).

Infants respond more positively to separation from the parent if they are left with any other person, particularly a familiar one; if they are left with toys of any kind and can see or hear their parents in an adjoining room (Corter, 1977); and if they are left with their own blankets or pacifiers (Halonen & Passman, 1978; Hong & Townes, 1976). The parent's saying, "bye-bye," or making some other parting gesture before leaving had no effect on the abilities of 1-year-olds to cope with separation (Corter, 1977). These parting gestures do seem to help older infants, however, and are discussed at greater length in the following section.

The Beginnings of Self-assertion

By the middle of the second year, infants' initiative taking becomes more self-conscious. Babies become aware of themselves as actors who have an effect on the environment, who can deliberately introduce changes, and who can manipulate the environment in order to produce an intended change (Piaget, 1952; Sander, 1964).

This newfound sense of self- and personal agency requires major adjustments in the adult-infant relationship. Infants have to learn to contend with the growing awareness of separateness from the adult, not an easy developmental task. Adults have to learn to channel the creative aspects of the child's budding autonomy, at the same time they seek the child's compliance with the demands of health, safety, and social decorum.

A good many new coping skills arise in the infant of this age. Instead of immediately becoming upset in a stressful situation, infants can be seen to fight back tears (Sroufe, 1979) or to bite their lower lips to control their distress (Demos, 1982). Infants can now use language to communicate their feelings to others, to reassure themselves, or to resort to a kind of pretend security in play situations (Piaget, 1964).

It is at this age that children come to rely on their teddy bears and blankets to comfort themselves. In studies conducted by Passman (1977) and Passman and Weisberg (1975), mothers rated their 2-year-olds' blanket attachment on a 10-point scale ranging from no attachment (1) to strong attachment (10). The sample was divided into blanket-attached children (those who scored between 6 and 10 on the scale) and non-blanket-attached children (those scoring below 6). The results showed that blanket-attached children with their blankets were able to comfort themselves better in a stressful situation without their mothers than were

either blanket-attached children without their blankets or non-blanket-attached children.

Some investigators have suggested that the infant's reliance on a blanket as a source of comfort comes at precisely the time when the child is becoming more aware of his or her physical and psychological separateness from the caregiver. Although this sense of self as an independent individual does not fully take hold until the third year of life, the end of the second year can be thought of as an important transitional phase in the growth of autonomy. The blanket and other such attachment objects have therefore been called transitional objects (Mahler, Pine, & Bergman, 1975; Winnicott, 1971) because they seem to serve as a bridge between the child's total reliance and dependence on the parent and the development of individuation.

Not all children develop blanket attachments. In countries where there is relatively more physical contact between infants and caregivers, there is less likely to be blanket attachment (Super, 1981). In a study of Italian children (Caddini, 1970) only 4.9% of rural children had transitional object attachments, while 31.1% of urban children in Rome had them. Hong and Townes (1976) found that Korean infants used transitional objects less than did a matched sample of American infants, and Caudill and Weinstein (1969) reported less sucking on fingers and pacifiers in the relatively more indulged (as compared with Americans) Japanese infants. It seems that in societies in which children have continued access to physical contact, there is little need for transitional objects. This finding does not imply that parents in the United States should opt for closer physical contact with their children; it merely suggests that the interaction between culture and childrearing is complex and that children from each culture will develop

culture-specific coping skills in response to culture-specific demands (cf. Fogel, in press).

By the end of the second year, infants are taking their own initiatives in separating from their parents. Ley and Keopke (1982) found that infants of this age, observed with their parents in a public park, were not afraid to wander off at some distance. The situation is different, however, when it is the parents who initiate a separation, an occurrence that could happen for many reasons. The parents might want to go out in the evening, or they may need to travel away from the child for several days. This is often the time when mothers go into the hospital to have a second child. Other occasions for separation include the father's or mother's business trips, out-of-home child care, and even brief hospitalizations for the child.

Research suggests that parent-initiated separation episodes are more tolerable to the 2-year-old infant if the parent prepares the child for them beforehand. In one study (Weinraub & Lewis, 1977), 2-year-old children were least upset during separation if the mother explained that she would be leaving and gave the child instructions on what to do in her absence. This situation was especially true for children who were more developmentally advanced and who could understand better the mother's instructions. It also seemed to help the child during the separation if the mother spent more time at a distance and less time in close physical contact with the infant in the minutes just prior to the departure.

One additional finding of the Weinraub and Lewis (1977) study should provide at least a small measure of comfort to both parents and caregivers. These researchers discovered that the infant's immediate response to the parent's departure was not correlated with anything the parent said or

did. Only after this initial response, when the infant finally calmed down, did the baby's behavior begin to reflect the efforts of the parent's work at preparation. Indeed, it seems common for babies of this age to protest loudly during the actual departure of the parent. As soon as it is clear that these protests are ineffective, the 2-year-old is generally capable of quieting down and even enjoying the substitute caregiver.

Another important issue for caregivers of children at this age is how to get the child to comply with the adult's wishes. How can adults effect immediate or short-term compliance while at the same time setting the stage for longer-term effects on child compliance and moral behavior? Although there has been a considerable amount of research on parental discipline styles and compliance in older children (Baumrind, 1967; Becker, 1964; Hoffman, 1970), relatively little has been done with children before the age of 3 years. This fact is surprising, since it is during the second year of life that children begin to assert themselves against the will of the caregiver.

One study of 27-month-olds found that children complied in over one-half of the situations in which requests for their compliance were made (Minton, Kagan, & Levine, 1971). In children of this age, Lytton (1979) found that suggestions are more likely to be followed by compliance than are command-prohibitions. This investigator also found that suggestions were most frequently used in situations in which the child had little reason not to comply (i.e., nonconflict situations). Schaffer and Crook (1980), in a study of 2-year-olds, found that compliance was more likely if the child was already disposed toward the situation. Thus, children who were asked to touch and pick up objects were more likely to do so if they were already looking at the objects. Children who were asked to manipulate

objects were more likely to do this if they were already looking at and touching the object.

Following this same line of research, Holden (1983) made unobtrusive observations of middle-class mothers and their 2-year-olds in a supermarket. Observers watched mothers respond to a set of "undesired behaviors" on the part of the child: asking for food, reaching for things, standing in the cart, and ignoring the mother's requests. One group of mothers used "contingent" responses--that is, they scolded or reprimanded the child after the transgression had occurred. The other group of mothers used "preventive" responses, such as talking to the child while shopping and giving the child something to eat. The latter group of mothers had children who showed fewer instances of undesired behavior.

Compliance, therefore, seems to arise as a natural result of the caregiver's attempt to fit into and to anticipate the child's behavior. From the child's point of view, the result is an increased feeling of control over the social and physical environment. This may seem paradoxical at first, since compliance typically is viewed as bringing the child under the adult's control. These studies seem to suggest, on the contrary, that compliance is the more-or-less automatic response of a child who has been allowed to develop his or her own initiatives within a carefully constructed caregiving frame. Indeed, Martin (1981-a, 1981-b) has shown that the more a caregiver attempts to assert power, demand firmness, and create an adversary position, the more likely it will be that the child will try to gain control. The children between 10 and 42 months of age whom Martin studied responded to parental coercion with behavior such as tugging, interfering, nagging, demanding, whining, touching, holding and questioning.

To summarize, these studies suggest that getting a child to comply fits into a more general pattern of creating effective caregiving frames. In other words, infants are more likely to comply if the caregiver creates a situation in which the child has no reason not to comply or in which there is no reason for the child to display the undesired behavior in the first place. In general, once the undesired behavior has begun, power assertion is not particularly effective. This does not mean that strong words and forceful discipline should not be used. One suspects that more research might reveal situations in which such methods are effective, but clearly the use of power as a regular tactic is questionable. Preventing troublesome situations and sensitivity to the child's states and goals seem to be the most effective "disciplinary" techniques for children this age.

Summary of Findings on the Parent-infant Interaction

Child-care philosophies are always in flux, dependent as they are upon family and cultural factors (Kagan, Kearsley, & Zelazo, 1978). It is only relatively recently in the history of child care that the scientific method has been trained upon problems in this area. For many caregivers, intuition is enough; the advice of experts is a needless headache of conflicting and personally dissonant views. As much as possible, this review attempts to focus on the results of scientific research while refraining from advice giving. Indeed, science is only a kind of mirror in which reality has been reflected back upon the viewers, and it is up to the viewers to clarify the image in their own terms. With this cautionary note, the following results concerning the caregiver-infant relationship are enumerated:

1. During the first year of life, caregiving is primarily one-sided, with the adult providing a series of interdependent "frames" that

initiate, maintain, support, and encourage infant behavior and development. These frames must constantly shift and change to correspond to changes in the infant's abilities and in particular to allow infants an increasing sense of control over their participation in the dialogue.

2. Because of this one-sided relationship, infants will readily accept substitute caregivers so long as those caregivers are willing to learn to fit themselves into the infant's regular patterns of behavior. At this age, infants are not likely to experience a psychological aversion toward strange people or places.

3. A baby's differentiation among people and wariness of strangers, occurring near the end of the first year of life, does not signal automatic rejection of others, but merely suggests that the infant is able to develop qualitatively distinct relationships with different individuals. The best rules for making friends with babies of this age seem to be no different from those for anyone else: courtesy, respect, and sensitivity to individual responses and desires.

4. Most babies are attracted in a positive way to new people.

5. The ability to cope with distress, separation, and uncertainty increases as the child becomes more verbal and more self-aware.

It is important to note that most of the advice on discipline and on the role of the caregiver in the infant's development given in child-care manuals is not based on systematic research. Certainly, parents and other caregivers need to do their jobs, and they cannot wait for research to verify what they feel intuitively are the best approaches. Nevertheless, child-care providers need to be updated on research findings as they

become available, as part of an ongoing process to dispell myths and outdated practices. The studies discussed have shown that infants have the potential to develop positive and rewarding relationships inside and outside the home. They do not tell us how infants fare in group-care situations, nor do they inform us about the long-term effects of caregiving practices. These will be the topics of the next two sections of this paper.

THE EFFECTS OF GROUP CARE ON INFANTS

Almost all the research on infants in groups has been done in high-quality day care centers; thus, it speaks for only a small proportion of the total population of young children who spend time in group-care settings. This means, in short, that much of what can be concluded from this research may not be generalizable to the entire population of children.

Parent-infant Attachment and Group Care

One of the main concerns voiced about group care has been whether, since infants often are separated from their parents for up to 8 to 10 hours per day, such arrangements disrupt the parent-infant attachment relationship. The answer seems to be that they do not. Children tend to prefer their mothers in stressful situations in which both mother and caregiver are available as a source of comfort, but in situations where quality care is given, infants can rely on the caregiver during the day and still maintain a special and different relationship with their parents (Kagan, Kearsley, & Zelazo, 1978; Portnoy & Simmons, 1978; Ragozin, 1980).

There is some evidence to suggest that the child's relationship to the caregiver is affected by parameters of the day-care situation. The most

important factors affecting parent-infant relationships are not the total number of caregivers but rather (1) the ratio of caregivers to children (1 caregiver to 3 infants under 18 months is desirable), (2) the emotional and physical availability of caregivers (one or more must be available to the child at least part of the time), and (3) the introduction of unfamiliar caregivers (new staff should be introduced gradually into the group). These findings suggest that day care not meeting these standards may have deleterious effects on the parent-infant relationship (Anderson, Nagle, Roberts, & Smith, 1981; Slaughter, 1980; Wilcox, Staff, & Romaine, 1980).

Until only a few years ago, most developmentalists sided with Bowlby's (1969) position that the "best" social environment for young infants consisted of attachment to a single important person, preferably the mother. Bowlby felt that more than one relationship during the first year would interfere with the infant's ability to develop attachments in general and with the mother in particular. Although research of the kind cited on the effects of group care allows us to see that infants can easily develop multiple relationships, not enough work has been done on the link between the infant's various social partners. Thus, we have little understanding about how experience in group care affects the parent-infant relationship, and vice-versa: we know that there is an effect, but we do not understand how it is mediated.

The Effects of Day Care on Cognitive Development

Aside from effects on parent-child relationships, researchers and parents have wondered if the day-care experience has any lasting impact on the child's cognitive development. Some studies of middle-income infants have shown that quality day care neither enhances, nor detracts

from, normal patterns of cognitive development (Kagan, Kearsley, & Zelazo, 1978). A recent study by Clarke-Stewart (1982), done in both day-care centers and day-care homes, showed that there was a significant increase in cognitive and social scores for day-care versus at-home-care infants. These recent findings should be a source of satisfaction to those involved in caregiving and the education of infants, for they seem to suggest positive outcomes as a result of consclentious efforts on the part of child-care providers.

Infants from lower-income backgrounds seem to benefit more from group care than do other infants. A recent report reviewed the findings of many research studies done on lower-income children who as infants had been in day care and preschool programs such as Head Start (Lazar & Darlington, 1982). Subjects were followed up between the ages of 9 and 19 years, and several results were reported.

As compared with children who had not been in group care, group-care children were more likely to meet their school's basic requirements, and they were less likely to have been retained a grade or to be in special education classes. This was true regardless of the child's sex, ethnic group, or family background. Group-care children had higher scores on Stanford-Binet IQ and standardized achievement tests; in addition, they were likely to focus on their own achievements, at school or work, as a reason to be proud of themselves. Finally, the group-care children were more likely than others to be affected by their mothers' attitudes toward school performance and vocational aspirations.

The Lazar and Darlington study is somewhat limited because it combined children in day care with children in preschool programs, like Head Start, and with children in parent-infant programs. One study has shown

that parent-child development center programs, in which the low-income mother is taught the basic principles of child development, caregiving techniques, nutrition, health, and personal development had a significant impact on maternal responsiveness and on the child's IQ at age 4 (Andrews et al., 1982).

In a related study (Slaughter, 1983), a 2-year early intervention program for low-income black mothers and their children, ages 18 to 44 months, was assessed with respect to the match between the intervention program and the social and cultural background that the mothers brought into the program. Specifically, the Levenstein toy demonstration program was contrasted to the Auerbach-Badger mothers' discussion group program. At the time of final evaluation, the mothers who participated in the discussion group were significantly higher on the Loevinger Scale of Ego Development, on observational measures of maternal teaching styles exhibited with their children, and on both frequency and quality of interaction with their children. The children of discussion-group mothers also verbalized more often during play. Children from both intervention groups scored higher on verbal and IQ measures than did controls, who were not exposed to any interventions. The investigator felt that the discussion group was more culturally relevant since it relied on sharing of experiences among group members and thus may have modeled an extended-family concept.

It seems, therefore, that group care can take many forms, both in terms of program format and in terms of the identity of participants. The effectiveness of group care may depend on the capacity of that care to support and foster the parent-child relationship. Encouraging this relationship is done by providing substitute care that is of comparable or

better quality than parental care and by adapting the specific program elements to the needs, beliefs, and values of the family's cultural and subcultural heritage. In the preceding section of this paper, it was concluded that caregivers must change their behavior to fit the child's, thus providing the child with a sense of personal control and self-efficacy. Slaughter's (1983) research suggests that group-care programs must fit the ongoing patterns of behavior within the family, thus giving the family a sense of control and a measure of respect for the strengths to be found within their own culture or traditional childrearing practices.

The Role of Other Children in Group Care Settings

A review of the effects of peer relationships on children in group care would take us beyond the scope of this paper, the goal of which is primarily to review the role of adults in infant development. However, there is a type of relationship that is an important intermediary between peer partnership and adult-child partnership; such relationships occur when children interact in mixed-age groups. Children are rarely exposed to nonpeers in formal educational or group-care settings. This sort of nonpeer relationship is most common between siblings, and there is a growing body of research on sibling relationships that attests to their importance (cf. Fogel, in press).

In order to bridge the gap between sibling relationships in the home and peer relationships in group-care settings, recently a new line of research has begun in which infants are brought together with unfamiliar preschool children (cf. Fogel & Melson, in press). In one study (Melson & Fogel, 1981), preschool children ages 3 to 5 years and of both sexes were left in a "waiting-room" situation with a 6-month-old infant whose mother,

reading a magazine in a corner, was instructed not to become involved with the child or infant. No sex differences were found in the preschoolers' interest in or willingness to interact with the infant; however, only about one-third of the total sample of 70 children actually attempted to interact with the baby. In a second study (Fogel, Melson, & Mistry, in press), mothers of the infants were instructed to follow a script to encourage the child to interact with the baby. The results were rather striking. The majority of the sample of 50 children became involved with the infant and seemed to enjoy the experience as much as the babies did. Again, no sex differences were found in the preschoolers' responsiveness to the infants. It seems that a relatively brief intervention by an unfamiliar adult (sessions lasted only 10 minutes) was enough to encourage a child placed in an unfamiliar setting with an unfamiliar infant to show positive responsiveness to the baby. Furthermore, parent reports indicated that 75% of the children in the sample express spontaneous interest in babies at least several times per week. Parents also reported equal amounts of interest in babies on the part of both boys and girls. The infants, for their part, showed much higher levels of interest in the children than the children did in them, rarely looking at their mothers when there was a child in the room.

Clearly, such research merely scratches the surface of a phenomenon with possible potential implications for early childhood education. Another study along similar lines (Berman, Monda, & Myerscough, 1977) placed an infant in a preschool classroom, a procedure which elicited considerable interest on the part of the children in the room. Researchers and educators may wish to develop and explore models for bringing children of different ages together. Because the interest children and infants have in

each other is so strong, one might expect to produce important educational benefits for both partners. Such educational benefits may occur especially in cultural contexts in which older children are expected to take a responsible role in the care of infants, such as that of black Americans, typically a culture having an extended family form of living arrangement (Whiting & Whiting, 1975; Fogel & Melson, in press).

LASTING EFFECTS OF EARLY EXPERIENCE

In addition to conducting research on the parent-infant interaction and the effects of group care, investigators have looked for long-term effects of variations in the physical and caregiving environments to which infants are exposed during their first few years of life. The studies on the effects of early group care suggest that long-term benefits are associated with some kinds of early experiences. However, there are qualifications to this finding, to be described in this section.

Infants at Risk

Newborn infants are susceptible to a wide range of perinatal problems, ranging from oxygen deprivation to low birth weight. For all infants, the period immediately following birth is a time of adjustment from intra- to extra-uterine life. Infants who suffer from one or more "risk factors" in the perinatal period may be unable to cope with the normal stresses of the first months of life and may therefore fall behind in their developmental progress.

In general, the research has found that many perinatal problems can be alleviated by a supportive environment. In a multiracial, multiclass sample of 670 infants born on the Hawaiian island of Kauai, it was found

that all groups of children--regardless of race, social class, or age of mother--suffered about the same proportion of perinatal complications (Werner, Bierman, & French, 1971). In this sample, 13% suffered moderate complications while 3% of the complications were severe. However, group membership predicted how well the infant recovered from the complication. Children born into lower-income families were less likely to recover fully by age 2. By age 10, the effects of perinatal problems had all but disappeared for all the groups, but children from lower-income groups had lower scores on intelligence tests and were doing more poorly in school than were children from middle-income groups.

Other research in this area has supported these conclusions. In general, the more stressful the environment--the more that parents lack economic and social support systems--the more likely it will be that infants will not recover quickly from perinatal complications (Crockenberg, 1981; Sameroff & Chandler, 1975; Waters, Vaughn, & Egeland, 1980). On the other hand, if there are adequate economic resources, if the parents are not under psychosocial stress, and if the infant is born normal except for the perinatal complications, then the effects usually do not persist.

Importantly, if infants are not at risk, then their behavior in the perinatal period seems not to predict any later aspects of infant functioning. Bell, Weller, and Waldrop (1971) found virtually no perinatal behavior that predicted the behavior of children in the preschool years. Dunn (1975) found that the success (or lack of success) with which mother and infant adjusted to each other during early feedings was not predictive of later mother-infant interaction patterns. Bell et al. (1971) and Dunn (1975) argue that the newborn is <u>buffered</u> against difficulties of early adjustment. Sameroff and Chandler (1975) speak of the infant as having a

self-righting ability: given an appropriately responsive environment, perinatal complications do not create any lasting organismic deficits, nor does perinatal behavior predict later functioning.

It may be that if parents are not under stress and are predisposed to provide competent caregiving, the infant at risk will evoke more maternal attention and solicitude than will a normal infant (Bakeman & Brown, 1980; Beckwith & Cohen, 1978; Crawford, 1982). This increased solicitude may be a factor in alleviating the early deficits in the first year or two of life. Thus, in certain circumstances, the environment can compensate for a wide range of individual variation.

The Effects of the Physical Environment

The physical environment surrounding the infant has been conceptualized in a number of different ways. Typical dimensions that have been measured are the amount and availability of visual and auditory, and kinesthetic and tactile stimulation; the variety of inanimate objects; the contingent responsiveness of inanimate objects; the amount of freedom the infant has to explore the home; and the amount of noise and confusion in the home.

Research has suggested that aspects of the child's physical environment may affect later development. For example, early exposure in the first year to a variety of inanimate objects and to contingently responsive inanimate objects has been shown to lead to greater skill in problem solving and exploratory play in the second year (Yarrow, Rubenstein, & Pedersen, 1975). Provision of age-appropriate play materials during the first 2 years strongly predicts the child's Stanford-Binet IQ score at 4½ years (Bradley & Caldwell, 1976) and elementary school achievement test

scores between 5 and 9 years (VanDoorninck, Caldwell, Wright, & Frankenburg, 1981).

Wachs (in press) has confirmed these findings and has introduced the notion of environmental specificity. In a sample of over 100 infants from a wide range of income groups and home environments, Wachs found that some aspects of the physical environment were more effective than others in promoting certain kinds of cognitive skills. For example, the development of spatial relations and perspective taking could be predicted best by the avoidance of noise, confusion, and environmental overcrowding during the first 2 years. On the other hand, exploratory play skills in the second and third year were best enhanced by providing responsive objects, and by offering a variety of objects, in the first year. These factors, plus a well-organized environment and the use of age-appropriate play materials, were the best predictors of the child's ability to invent new means and plan effective strategies (Wachs, in press; Wachs & Gruen, 1982).

It is interesting to note that environmental stimulation is not uniformly beneficial for all infants. Some forms of environmental stimulation have been found more effective for promoting the cognitive development of girls as compared with boys (Wachs & Gruen, 1982). Specifically, females were helped most by long-term stimulus variety, but they were relatively unaffected by overcrowding and noise confusion. On the other hand, males were negatively affected by noise confusion and by overcrowding but were positively affected by opportunities for exploration. It therefore may be that males are more vulnerable to stresses occurring early in life.

Interaction with the Social Environment

A number of more recent research studies have shown that social and cognitive competence in preschool children--defined as a cluster of high IQ, advanced language skills, sociability to strangers, social competence in the peer group, and sociability in interaction with the mother--is strongly related to the quality of the early mother-infant relationship at 1 year. In particular, such competence is associated with the mother's early positive and responsive interaction with and verbal responsiveness to the infant (Clarke-Stewart, VanderStoep, & Killian, 1979) and with the security of attachment of the infant to the mother (Arend, Gove, & Sroufe, 1979; Pastor, 1981; Waters, Wippman, & Sroufe, 1979).

Just as environmental specificity operated upon the interaction between physical environment and organism, there is also evidence for specificity in the interaction between social environment and organism. For example, tactile and vestibular stimulation from physical contact with the caregiver enhances later cognitive development, but only for the first few months. Maternal vocalization, contingent responsiveness, and involvement become important between 6 and 24 months, after which a lack of restrictiveness and the provision of opportunities to interact with other people are the best predictors of cognitive and language development (Bradley, Caldwell, & Elardo, 1979; Carew, 1980; Feiring & Lewis, 1981; Wachs & Gruen, 1982).

Need for Improved Research

The studies reviewed thus far have several limitations. First of all, they are almost all longitudinal studies of naturally occurring processes. There is nothing inherently wrong with such investigations, in fact, our

understanding of human development would be enhanced if a greater number of carefully planned longitudinal studies were carried out. The problem is, however, that never can something measured at an early stage be established as the sole factor responsible for an outcome measured at a later age. For example, although the availability of responsive toys during the first year predicts cognitive development in the second year, this effect may be due to the involvement of the caregiver. If responsive toys and involved caregivers always go together, then there is no way to tell which of these factors is more important. It could be that in the absence of toys, an involved caregiver would be sufficient to foster cognitive-developmental skills.

An experimental manipulation could sort out the relative contributions of these factors, but scientific ethics prevent us from manipulating people's lives in a manner that would be most instructive. Therefore, the methodological solution to this problem is to learn better ways to interpret the data from nonmanipulative longitudinal studies, and to avoid being fooled by the mere appearance of causality.

The other major problem with the investigations discussed is that they are limited to studying what can be measured with a valid and stable assessment scale. Infant assessment is a skill not yet well-learned. There are a great number of extremely important dimensions of individual variation for which no carefully validated assessment scale exists. Examples of such dimensions are emotional maturity, coping skills, and social competence. One of the challenges to a science of infant development is the development of behavioral assessment techniques that capture the subtleties of emotional expression, interpersonal communication, and social competence (Adamson & Bakeman, 1982).

Finally, there are a whole host of questions that are crucial to our understanding of child and adult development: Why do some people develop psychopathology while others do not? Why do some, but not all, children have nightmares? and, Why are some people shy while others are outgoing? There is research related to all of these questions and others like them, but it suffers from poor conceptualization, lack of adequate experimental and statistical controls, and lack of representative samples of subjects. These flaws are not unique to infancy research; rather, they speak to a general need to improve research methods in all aspects of the social sciences.

INFANTS AND ADULTS: SOME CONCLUSIONS

The research summarized in this discussion leads to several conclusions. First, the environment plays a crucial role in the direction that development takes. If there is a strong relationship between an organismic factor early in development and the same factor in later development, the research suggests that this is not because of some stability within the infant, but because of stability within the environment--stable parental behavior, usually--that elicits similar behavior from the child at different ages (Bradley & Caldwell, 1981). In the absence of a supportive home environment of this sort, institutional care may be a crucial factor in stabilizing the infant's continued development (for example, Head Start--see Lazar & Darlington, 1982).

Second, in certain situations, early education can have a major impact on improving the home-care environment. For example, the success of parent-child development centers might be mentioned (Andrews et al., 1982). Improvements in the home-care environment may be especially

likely if the early intervention program is designed to fit the cultural context of the target population (Slaughter, 1983).

Finally, in the case of a healthy and supportive home environment, early infant education can extend, complement, and enhance developmental progress, not to mention providing needed encouragement for the parent's job well done (see Clarke-Stewart, 1982). Early education programs that focus only on the child are not likely to be as successful as those that incorporate the family into their curriculum and the culture into their philosophy.

A supportive environment can enrich the infant's life, but the environmental quality must be sustained and continually modified to meet the changing needs of the child at each age. During the first 3 years, it is more appropriate to think of adults as "environmental scaffolds" than as sources of new information. As such, adults temporarily erect social contexts that give the child a sense of control and efficacy in a limited sphere of endeavor and gradually allow the context to be superceded by genuine forms of self-control in the child. The role of information provider is consonant with the view of the teacher of somewhat older children, who have already developed to the point that they can profit by the direct input they obtain from other people.

As compared with young children, infants need a curriculum in which "educational" experiences are presented with due respect for the emotional and social-control limitations of the pupils. The infant care "curriculum" should not be fixed or standardized. There is no evidence that caregiver acceleration of infant learning is effective, nor can infants be expected to climb up an already-built developmental scaffold. Instead, caregivers should be encouraged to provide small challenges within a scaffolding

structure that is uniquely responsive to the individual infant and to the infant's developmental changes. It is the ongoing elaboration and change in this framing, or scaffolding, network that seems to be the most effective guarantor of the lasting impact of infant educational programs--plus a vision that includes the infant's family and culture within that supportive network.

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